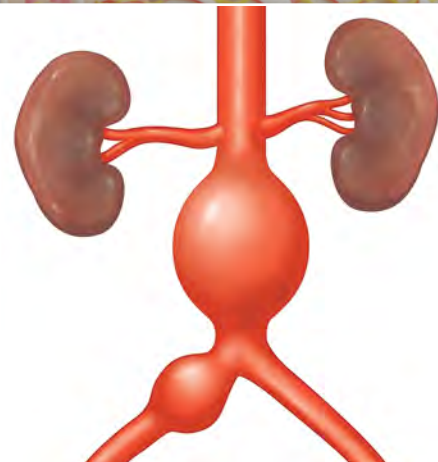


# PROCEDURES FOR ABDOMINAL AORTIC ANEURYSM



Treating Weakness  
in the Aorta

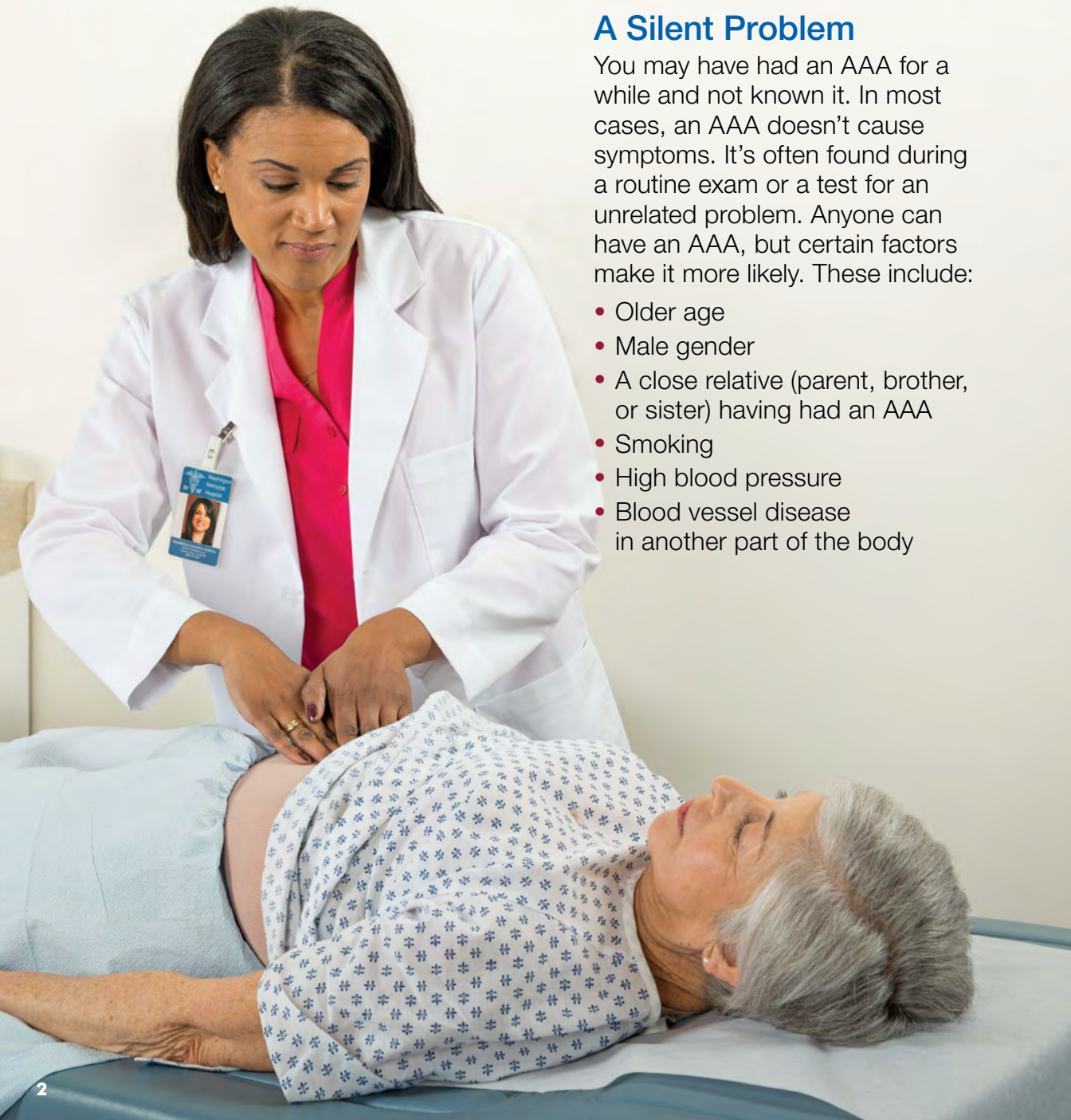
# A Weakened Blood Vessel

You have been told you have an **abdominal aortic aneurysm (AAA, or “triple A”)**. This is a balloonlike bulge in a major blood vessel, the aorta. If this bulge ruptures, it can cause serious, even fatal, problems. Now that you know you have an AAA, steps can be taken to treat it and prevent a rupture.

## A Silent Problem

You may have had an AAA for a while and not known it. In most cases, an AAA doesn't cause symptoms. It's often found during a routine exam or a test for an unrelated problem. Anyone can have an AAA, but certain factors make it more likely. These include:

- Older age
- Male gender
- A close relative (parent, brother, or sister) having had an AAA
- Smoking
- High blood pressure
- Blood vessel disease in another part of the body





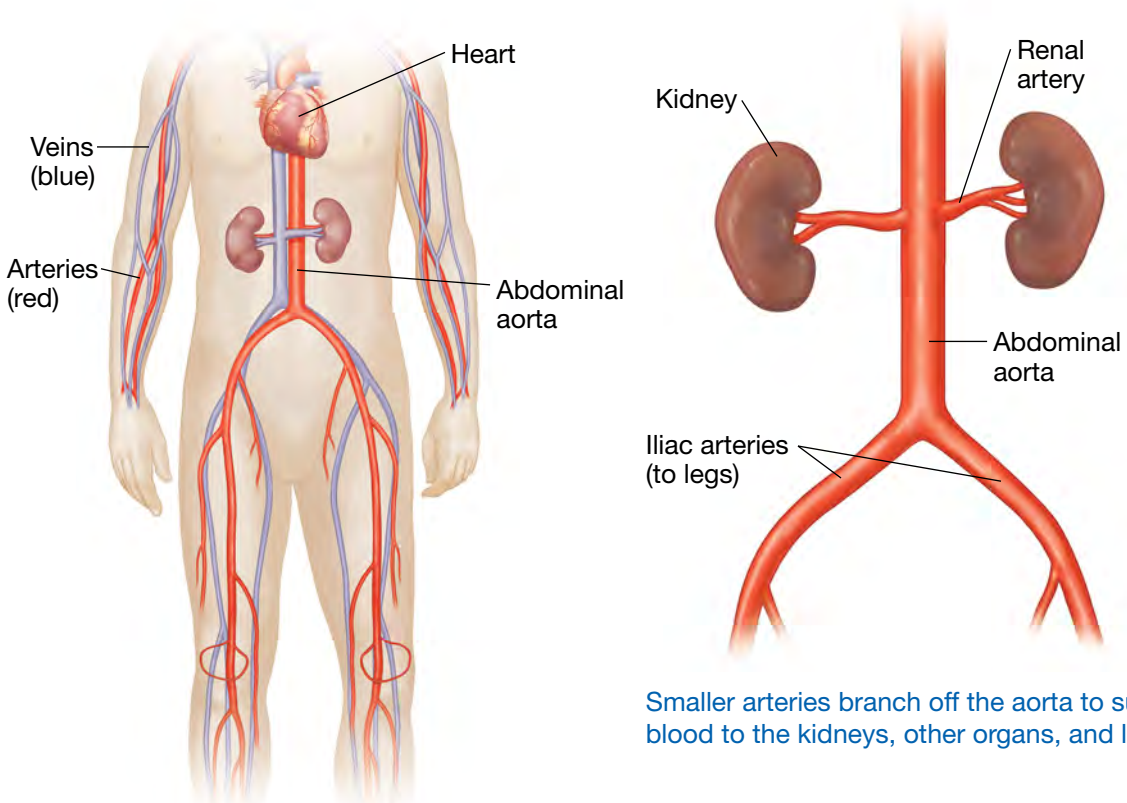


## The Next Step

Learning that you have an AAA can be a shock. Understanding your treatment options can help you feel more in control. Your healthcare team can answer your questions about your condition and treatment. This team may include your primary healthcare provider, nurses, and a vascular surgery specialist. Treatment often depends on several factors. These include your age, your overall health, the location of your AAA, and the shape, size, and condition of your blood vessels. As you and your team discuss the best treatment for you, be sure to get all your questions answered. By being informed, you can help your doctor ensure that your needs are met.

# Understanding AAA

**Blood vessels are tubes that carry blood throughout the body. Arteries are blood vessels that carry oxygen-rich blood from the heart to the rest of the body. (Blood vessels that carry blood back to the heart are called veins.) AAA affects the largest artery in the body, the aorta. It occurs when part of the aorta weakens and expands.**



The abdominal aorta carries oxygen-rich blood from the heart to the lower body.

Smaller arteries branch off the aorta to supply blood to the kidneys, other organs, and legs.

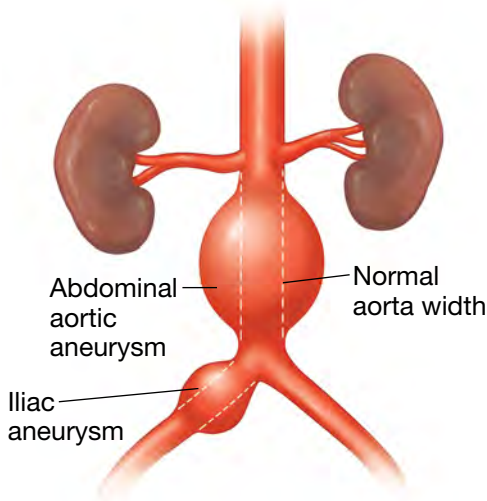
## What Is the Aorta?

The aorta is the large artery that carries blood directly from the heart. Smaller arteries branch off the aorta. These carry blood to all parts of the body. The part of the aorta that travels through the abdomen (stomach area) is called the **abdominal aorta**. Arteries branch off the abdominal aorta to carry blood to organs in the abdomen. These include the renal arteries, which carry blood to the kidneys. In the middle of the abdomen (in the area of the belly button), the aorta splits into two branches. One branch runs down each leg. These are called the **iliac arteries**.

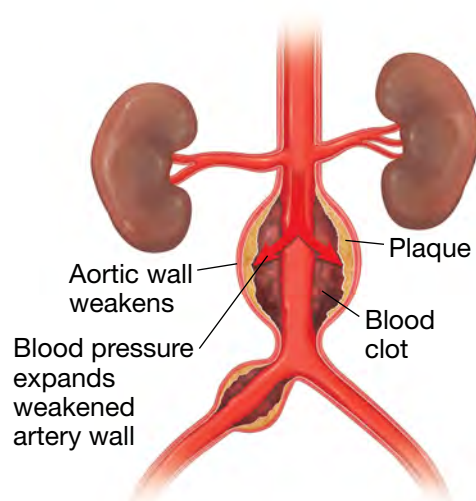


## When an AAA Forms

If an artery is damaged or weakened, it can stretch outward, expanding like a balloon. The resulting bulge is called an **aneurysm**. As it expands, the artery wall thins and weakens even more. It may become so thin that it ruptures (leaks, bursts, or tears open). This can be fatal if not treated right away.



An aneurysm forms when part of the wall of the aorta weakens and balloons outward. Aneurysms can form in the iliac arteries, too.



High blood pressure can strain a weakened artery wall. Plaque (fatty material) may be found in the damaged artery wall. Blood may also form clots around the plaque. All these can damage the artery further.

## AAA and Arterial Disease

The same factors that cause AAA can lead to disease in other arteries. If you have an AAA, you're also at risk for heart attack, stroke, and artery problems in the legs and other areas of the body. Your healthcare provider may advise that you be screened for these conditions.

### Brain

If the arteries supplying the brain are blocked, a stroke may result.

### Kidneys

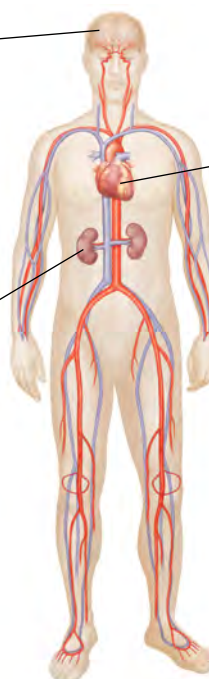
Blocked renal arteries can cause kidney problems.

### Heart

A blockage in an artery supplying the heart muscle can cause a heart attack.

### Legs

A blockage in a leg artery causes a painful condition called peripheral artery disease.



# Your Evaluation

**An exam and tests give your doctor more information about your AAA. Tests measure the size of the aneurysm. They can track changes in the AAA over time. Tests may also be done to measure blood flow.**

## History and Physical Exam

Tell the doctor about any health problems you have and if anyone in your family has had an AAA. Also mention if you smoke or have high blood pressure. During the physical exam, the doctor will check and feel your abdomen. Other parts of your body may also be checked to rule out other problems.

## Imaging Tests

You will likely have imaging tests to help determine the size and shape of the aneurysm. These may include:

- **Ultrasound.** Sound waves are used to create images of the blood vessels. The images are viewed on a video screen.
- **CT (computed tomography).** X-rays and computers are used to take detailed pictures of the aneurysm. Before the test, you may be given contrast fluid through an **intravenous (IV)** line. This helps arteries show up clearly.
- **MRI (magnetic resonance imaging).** A strong magnet, radio waves, and computers are used to create pictures of the aneurysm. A type of contrast fluid may be used.

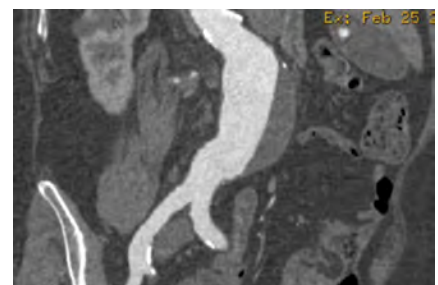
## Other Tests

If you have surgery, these may be done.

- **Arterial Doppler study.** Blood flow in the legs is measured using a special probe and blood pressure cuffs that are placed on the legs.
- **Arteriography.** This test creates an x-ray image (arteriogram) showing the blood flow through the aorta and other arteries. Contrast fluid is used for this test.



Ultrasound of an AAA



CT scan of an AAA



# Treatment Options

**Your options for treatment depend on many factors. How big is the aneurysm? Is it growing? If so, how quickly? How is your overall health? These and other factors are considered when weighing the risks and benefits of each treatment. Together, you and your doctor can decide on the best course of action.**

## Watchful Waiting

A small aneurysm is unlikely to rupture. So if your AAA is small, your doctor may suggest watchful waiting. During watchful waiting, you:

- **Have regular monitoring.** You'll have imaging tests once a year or more to track your rupture risk. If the aneurysm reaches a certain size or is growing quickly, repair may be needed.
- **Take steps to reduce your rupture risk.** Steps such as controlling blood pressure and quitting smoking may make the AAA less likely to grow or rupture. It can also help improve the health of your arteries. This helps you prepare for surgery if that is needed. See page 15 for more details.
- **Stay alert for symptoms of rupture.** An AAA rupture is an emergency! If you notice any of these changes, **CALL 911** right away:
  - Pain in your abdomen, back, or side
  - Dizziness or feeling faint
  - A tender spot in your abdomen that pulses with your heartbeat



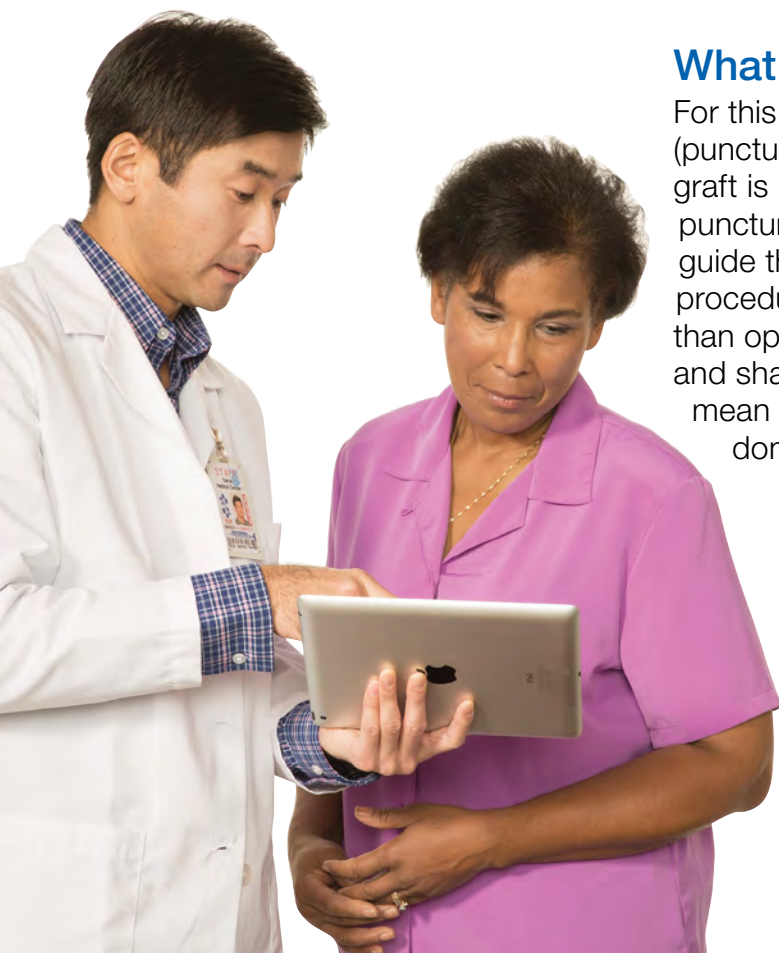
►► You may be taught to monitor your own blood pressure at home.

## Considering Surgery

Watchful waiting lets you and your doctor monitor an AAA that is at low risk for rupture. If the AAA is large or growing quickly, it is at high risk for a rupture. If this is true for you, you'll likely be advised to think about surgery. See pages 8 and 9 for more details about surgical repair of an AAA.

# AAA Repair Techniques

An AAA can be treated with **endovascular repair** or **open surgery**. Both methods involve placing an artificial **graft** inside the damaged artery. Each type of procedure has risks and benefits. Talk to your doctor about which might be best for you.



## What Is Endovascular Repair?

For this procedure, very small incisions (punctures) are made in the groin. The graft is inserted into an artery through a puncture. The surgeon uses x-rays to help guide the graft to the aneurysm. This procedure often allows faster recovery than open surgery. In some cases the size and shape of a person's blood vessels mean that this procedure cannot be done. Pages 10 and 11 tell you more.

## Risks and Complications of Endovascular Repair



*Risks and possible complications include:*

- Infection
- Bleeding
- Injury to nearby blood vessels or organs
- A leak around the endovascular graft
- Blood clot at the graft
- Other problem with the graft
- Blood clots in the legs
- Kidney failure
- Injury to the spinal cord
- Injury to the bowels
- Conversion to open surgery
- Heart attack or stroke





## What Is Open Surgery?

With this method, a single large incision is made in the abdomen. The graft is then put into the artery above and below the aneurysm. It takes longer to recover from open surgery than from an endovascular repair. For some people, though, this may be the only way to repair the aorta. See pages 12 to 14 to learn more.

## Preparing for Either Procedure

- Have tests as advised by your surgeon.
- Tell your surgeon about all medications, herbs, or supplements you take. It's vital to mention if you take aspirin, ibuprofen, or medications to prevent blood clots. You may need to stop taking some or all of these before the procedure.
- Stop eating and drinking before the procedure as directed.

## Risks and Complications of Open Surgery

**!** *Risks and possible complications include:*

- Infection
- Bleeding
- Blood clots in the legs
- Pneumonia or other lung problems
- Kidney failure
- Injury to the spinal cord
- Injury to the bowels
- Injury to the ureters
- Impaired sexual function (in men)
- Blood clot at the graft
- Irregular heartbeat
- Heart attack or stroke

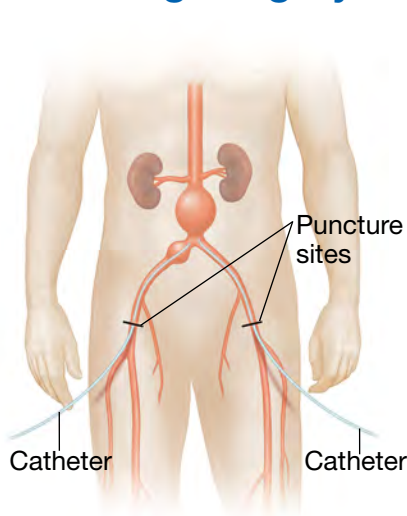
# Endovascular Repair

**A graft made of wire mesh and fabric is placed inside the aorta. This takes stress off the weakened artery wall. You will likely stay in the hospital for one or two nights after the procedure.**

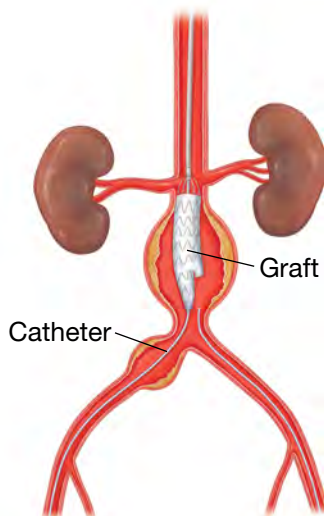
## At the Hospital

- An IV line is put into your arm or hand to give you medication and fluids.
- You may be asked your name and what procedure you're having more than once. This is for your safety.
- You receive **anesthesia** (medication used to keep you pain free during surgery). This may make you relaxed and lightly asleep. Or it may put you into a state like deep sleep throughout the surgery.
- You are taken to the procedure room. You lie on a table beneath x-ray cameras. These cameras are used to help place the graft.

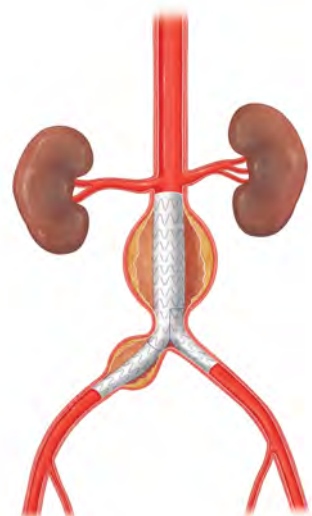
## During Surgery



Two small punctures are made in the groin. A catheter (thin, flexible tube) is threaded through an artery at each puncture. The collapsed graft is placed inside one of the catheters.



The surgeon uses x-rays to guide the graft. It is moved through the arteries toward the damaged part of the aorta. The graft is placed into position. More than one graft piece may be used.



Once it is in position, the surgeon expands the graft. Metal springs or hooks hold the graft in place. After the graft is placed, the catheters are removed. Then, the punctures are closed.



## After the Procedure

You're taken to your hospital room. During this time, you are monitored closely. The IV and a urinary catheter (tube to drain urine) may remain in place until shortly before you leave the hospital.

## Going Home

When you are cleared to go home, have an adult family member or friend ready to drive you. Recovery can take several weeks. During this time, take medications as directed. Also, be active by taking walks and moving around. This can help promote healing.

## Follow-Up Care

After this repair, close follow-up is needed to check the position of the graft and the condition of the aorta. In most cases, imaging tests are done a few weeks after the procedure, then at least once a year after that. If there is a problem with the graft, another repair or an open surgery may be needed to fix it.

## When to Call the Doctor



*Call your doctor if you have any of the following:*

- Chest pain or trouble breathing
- Increasing pain, swelling, redness, warmth, bleeding, or drainage at the puncture site
- Fever of 100.4°F (38°C) or higher
- A change in the temperature or color of the feet or legs
- Pain in the legs, side, abdomen, or back



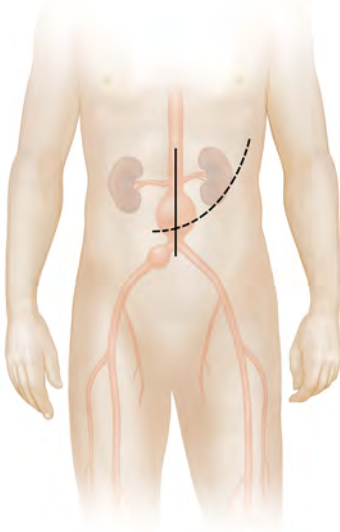
# Open Surgery

A graft made of strong, flexible fabric is used to replace the weak section of the aorta. You will likely stay in the hospital for a week or longer after the surgery.

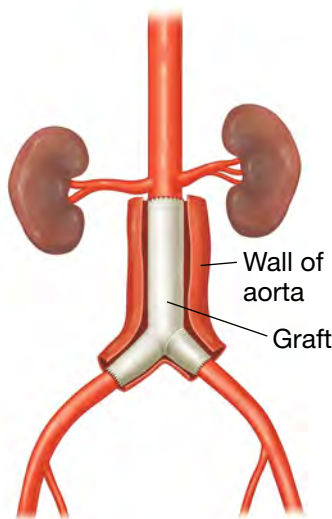
## Before Surgery

- An IV line is put into your arm or hand to give you medication and fluids.
- You may be asked your name and what procedure you're having more than once. This is for your safety.
- You receive **anesthesia** (medication used to keep you pain free during surgery). This will likely be **general anesthesia**. This puts you into a state like deep sleep through the surgery. You may also be given pain medication through a thin, soft tube inserted into the spine (an **epidural**).
- You are taken to the operating room and the procedure begins.

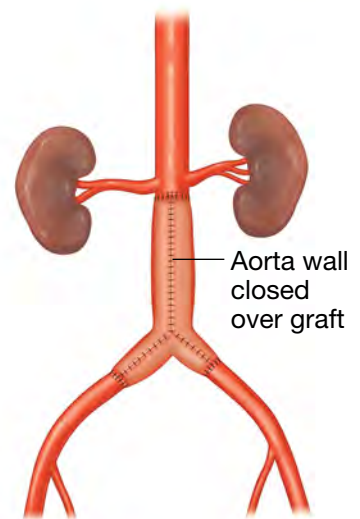
## During Surgery



An incision is made in your abdomen. Two possible positions for this incision are shown above. (The one shown here as a dotted line may continue around the side of the body.) The size and shape of your own incision may vary.



The surgeon gently moves aside the organs to reach the aorta. The aorta is clamped to stop blood flow. The surgeon then opens the aneurysm and cleans out the blood clot. The graft is then placed into the aorta at the aneurysm.



To protect the graft, the aorta is sewn closed around it. Some of the aorta wall may be removed to ensure a snug fit.

## Right After Surgery

After surgery, you are taken to an intensive care unit (ICU). You are monitored and your vital signs checked. You are given pain medication as needed. If you had an epidural, it may remain in place for a time. At first, you'll have several tubes to help your body function. They will be removed when they're no longer needed. These may include:

- The IV line to give you fluids.
- A catheter to drain urine.
- A tube in your throat to help you breathe.  
(This may keep you from being able to talk.)
- A tube passed through the nose into the stomach (nasogastric tube).  
This helps prevent nausea and other problems. It can also be used to give you food.

## In the Hospital

You are moved from the ICU to a hospital room. There, you are checked often to be sure you're recovering well. During your hospital stay:

- You're helped to get up and walk soon after surgery. As you gain strength, you walk farther and are up for longer.
- Medication is given to control pain. This may be pills. Or you may have a PCA pump that lets you give yourself IV medication within limits set by your surgeon.
- You're taught breathing exercises. These help prevent lung infection.

## Going Home

Before you go home, you'll meet with your surgeon to discuss the surgery results. You will also be given instructions for taking care of yourself at home. When you are cleared to go home, have an adult family member or friend ready to drive you.



►► A device called a spirometer helps you practice taking deep breaths.

# After Open Surgery

**Recovery from open surgery can take a few months. Follow the instructions you have been given for taking care of yourself. If you have any questions, be sure to get them answered.**

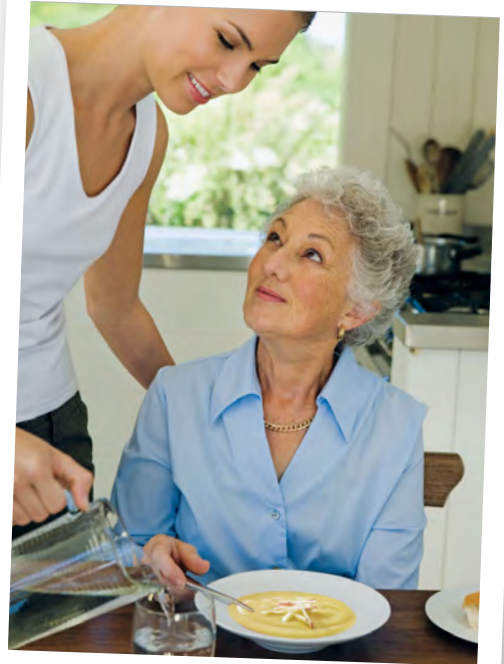
## Your First Weeks at Home

Follow instructions for what to do at home. Be sure to:

- Take medications exactly as prescribed.
- Care for your incision as directed. Do not shower or bathe until your surgeon says it's okay.
- Avoid heavy lifting, strenuous exercise, and driving for as long as directed.
- Ask a family member or friend to help with shopping, cooking, and other chores.
- Keep any follow-up appointments with your surgeon.

## Your Long-Term Recovery

At first, you may have less energy than usual. This may last for 2 to 3 months, or even longer. Exercise can help you get back to your full strength. So be as active as you feel able. Don't overdo it, though. If something hurts, stop. If you have any concerns about being active, talk to your doctor.



## When to Call the Doctor



*Call your doctor if you have any of the following:*

- Chest pain or trouble breathing
- Increasing pain, swelling, redness, warmth, bleeding, or drainage at the incision site
- Fever of 100.4°F (38°C) or higher
- Pain in the legs, side, abdomen, or back



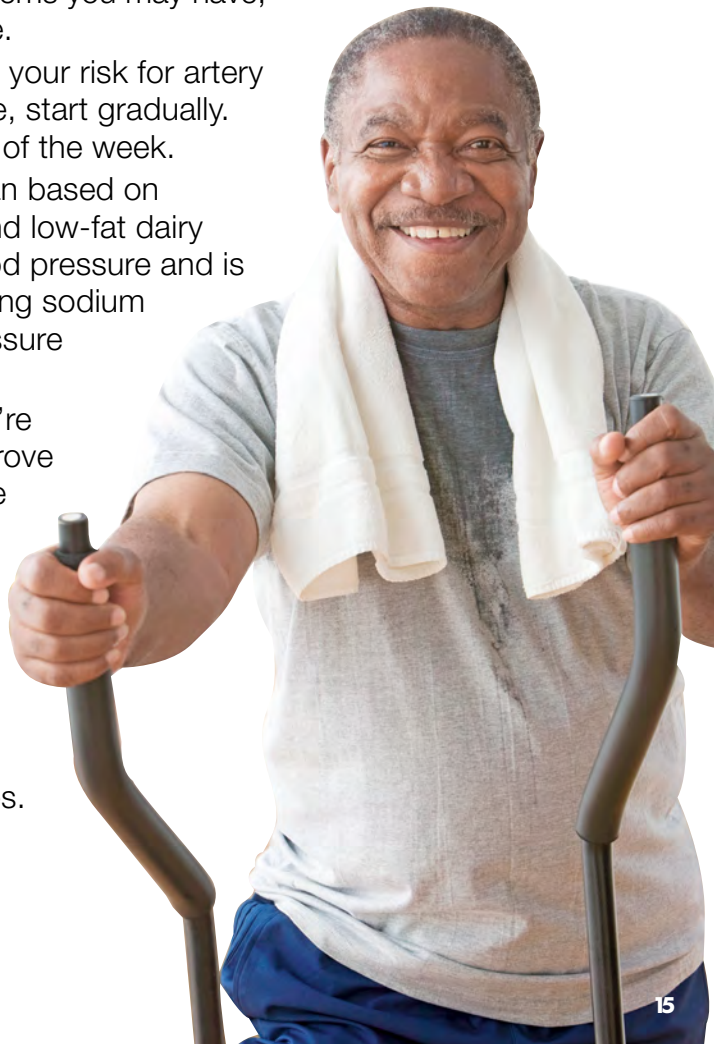
# Living a Healthier Life

**Part of watchful waiting is taking steps to reduce the risk that the AAA will rupture. These same steps can also help reduce the risk for artery problems in other parts of your body. Below are changes to make. Your healthcare provider can help you get started.**

## Steps to Healthier Arteries

The steps below help reduce your rupture risk. They help make your arteries healthier. They also help manage other health problems you may have.

- **Quit smoking.** Smoking raises blood pressure. It damages arteries. It also makes blood clots more likely. For your health, make it a goal to quit for good! Ask your healthcare provider for help.
- **Manage blood pressure and other health problems.** If you have high blood pressure, follow your healthcare provider's plan for keeping it under control. Also, take steps to manage other health problems you may have, such as diabetes and heart disease.
- **Exercise.** Daily exercise can lower your risk for artery problems. If you're new to exercise, start gradually. Work up to 30 minutes most days of the week.
- **Eat healthier.** Follow an eating plan based on vegetables, fruits, whole grains, and low-fat dairy products. This can help lower blood pressure and is good for your general health. Cutting sodium (salt) can also help with blood pressure management.
- **Maintain a healthy weight.** If you're overweight, losing weight can improve your health. Talk to your healthcare provider about getting started.
- **Take medication as prescribed.** Medications can help control blood pressure, diabetes, and other health problems. If you have been prescribed medication, take it as directed. Be sure not to miss doses.





## Screening for an AAA

You learned about your AAA in time to do something about it. But you're not the only one who should take heed. AAA runs in families. This means that your brothers, sisters, and children could be at risk. Screening could save the life of someone you love. So urge your family members to ask their healthcare providers about screening for an AAA.

**Also available in Spanish**

**TAKE OUR PATIENT SURVEY.** Help us help other patients.  
Please visit [www.KramesSurvey.com](http://www.KramesSurvey.com) to provide your feedback on this booklet.

This booklet is not intended as a substitute for professional medical care.  
Only your doctor can diagnose and treat a medical problem.  
©2015, 2018 Krames, LLC. [www.kramesstore.com](http://www.kramesstore.com) 800.333.3032  
All rights reserved. Made in the USA.

